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Insect Control - Modoc (Shasta)
White Horse Project

Alturas, California
May 27, 1932

WHITE HORSE INSECT CONTROL PROJECT

Spring 1932

The McCloud River Lumber Company

and

U. S. Forest Service

Cooperating

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Pine beetles have caused considerable losses to the large stands of Ponderosa Pine in the Modoc and Shasta National Forests as well as adjoining timber holdings in and near them. The White Horse Unit comprising nearly 90,000 acres of timberland is located near the extreme southwestern portion of Modoc county and along the southeastern portion of Siskiyou county, in northern California.

Within this area the western pine beetle, Dendroctonus brevicomis, has been the chief offender. While the timber losses have not increased continuously they have been noticeable for several years. Since The McCloud River Lumber Company has been operating within this area they have realized this source of loss, and have spent considerable money combatting it.

The U. S. Bureau of Entomology has kept timber loss figures caused by the western pine beetle for the past eleven years on sample plots within the White Horse Unit. Their figures expressed in percent of the total stand are as follows:

1921	.20%
1922	.24%
1923	.17%
1924	.42%
1925	.82%
1926	1.19%
1927	1.27%
1928	1.34%
1929	.49%
1930	.54%
1931	1.27%
11 years	7.77%

From the cruise made in the fall of 1931 by representatives of the Bureau of Entomology, U. S. Forest Service, and The McCloud River Lumber Company the latter figure of 1.27% was obtained. This, in conjunction with sample road strip cruises made at the same time, showed an apparent loss of 200% to 300% over that of 1930. While heavier losses were indicated on the deeper soils of mostly company timber there were considerable losses noted on the lava types principally Government owned.

Since there was considerable area of intermingled company and Government lands quite heavily infested with bugs that had never been previously treated

and since for either party to work their own holdings without the other being worked would prove impractical and ineffective, it was agreed between the U. S. Forest Service and The McCloud River Lumber Company to do cooperative "bug" work on this area providing an agreement could be arranged.

Due to the long dry season of 1931 the bugs had either completed or nearly completed two cycles or attacks. The fact, that a large portion of the winter brood of bugs had only recently attacked the trees made it appear desirable to have the work done during the late winter and spring months to increase the chances of locating them. Accordingly the agreement was executed March 28, 1932.

By this agreement there was to be a total available project fund of $4000.00 which was to be set up in equal amounts by the Forest Service and The McCloud River Lumber Company, one-half of which was to be spent on the lands of each party. Following is the actual set up of the funds prior to work.

Project Funds (Combined)			Project Funds (Additional)	
U.S. Forest Service	McCloud River Lbr. Company	Sub Total	McCloud River Lbr. Co.	Complete Total
$2000.00	$1850.00	$3850.00	$150.00	$4000.00

The $3,850.00 account was established as a Forest Service fund and all project bills were vouchered against it by the Forest Service, while the $150.00 account was paid directly by the McCloud Company for the services of a cost accountant for the entire job. The division of the work by land ownership was on a basis of M.B.M. of trees treated on the lands of each party. A Forest Service representative was in direct charge of the work.

AREA SELECTED FOR CONTROL OPERATIONS:-

The area selected for treatment was most of the east half of T. 41 N., R. 4 E., M.D.M., and a small area along the west edge of T. 41 N., R. 5 E., M.D.M., involving about 9,280 acres, all being intermingled ownership. After this area was completed any remaining funds were to be spent on government or company lands to the east or south as required to obtain a proper balance of expenditures in accordance with cooperative agreement. On this area it was estimated by the U. S. Bureau of Entomology that there would be nearly 70 trees per section needing treatment.

ORGANIZATION OF CONTROL WORK:-

The White Horse camp of The McCloud River Lumber Company was within five miles of the edge of the area to be treated and was used as a headquarters

to work from. All men boarded at the company cookhouse and were transported to work by means of trucks. The trucks were contributed by the company, but the gas and oil paid for from project funds.

There were two Forest Service men on the job most of the time, who served as foremen for all the work. Their time was contributed by the Forest Service and did not come out of the $4000.00 fund. As additional overhead a cost accountant was employed from the separate company fund, but carried as a direct cost against the project and is included in the $4000.00 set up.

Following are the wages paid for the various activities:

Activity	Rates Per Hr.	Per Day	Board & Lodging Daily	Net Daily
(Spotting)	62½¢	$5.00	$1.37	$3.63
(Falling & Straw-Bossing)	50¢	4.00	1.37	2.63
(Treating)	40¢	3.20	1.37	1.83
(Falling & Treating)	45¢	3.60	1.37	2.23

Spotting began on March 25, 1932 and ended on May 3, falling began on March 28 and ended May 4, and treating began on April 5 and ended May 6.

At the start of the work there was from 0 to 18 inches of snow. The Company broke all roads by means of a specially built hydraulic snow plow attached on front of a "sixty" caterpillar tractor which facilitated transportation to the work. Some delays were necessitated on account of rainy weather, but this permitted work to continue without a close down on account of fire danger. It may be said that the weather was ideal for the completion of the job.

METHODS AND RESULTS OF WORK:-

Spotting:

The spotting was done by a four man crew consisting of one compassman and three spotters. A strip cruise method covering a ten chain width was used. A 100% spotting cruise was made on an area ranging between 320 and 480 acres per day, which meant from four to six miles of compass line. At the beginning of the job five or six miles per day were spotted, but it was soon quite thoroughly demonstrated that the job was sacrificing effectiveness and four miles were found sufficient for satisfactory work. This conviction was based on a number of undesignated infested trees found by the foreman on areas already spotted, and on trips on which he accompanied the spotters.

It is quite readily seen that for a spotter to visit the majority of the trees on a 3-1/3 chain strip for a distance of six miles he will of necessity have to travel 12 to 20 and even more miles per day. Having gone on some of these trips as a spotter permits a person to appreciate the reason for the spotter dragging his feet on the last few miles of the run. If the spotting were done in a smooth, level country instead of a rough lava type it might be possible to spot a larger area. Many of the trees had not faded sufficiently so that spotting could be done entirely on a basis of foliage color. An individual tree inspection was necessary, otherwise six or even more miles could be covered. On this job at least one-quarter of the trees spotted were green foliaged. A check of the spotting record cards would show the exact percentage.

In regard to spotting, the job was recommended to be done in the spring so that a larger percentage of the trees would show fade, however, it appeared quite certain on this job that the only trees showing fade had shown it last fall. It is possible to expect bug attacked trees to show additional fade in the early spring following a fairly moderate winter, but for weather as encountered this winter little additional fade would show until the warm days of spring actually arrived, at which time it would be most too late to do burning on account of fire danger.

The foreman kept watch of the area spotted each day, and thus instructed the spotters on the additional area to be covered. This work was supervised closely by the foreman to be certain that the work was being done satisfactorily.

TREATING METHODS USED:

The actual treating went through various evolutionary stages with different methods involved. The following method was used to a large extent in accordance with the working plan.

METHOD NO. 1 (Falling and Treating Separately)

Falling

After the spotting had been done and the bug trees located on map sheets a set of two fallers took a copy of the map for the section and fell all the trees mapped. Two sets of two-man crews, with the aid of a third at times, were able to keep ahead of the maximum number of 32 treaters. As soon as the fallers had a little practice they were able to take the map sheet and go from tree to tree by themselves. This simplified supervision once the fallers had learned to use the map and the most advantageous place to fell the tree with reference to ease of treating.

Treating

The treating then consisted of limbing, peeling, digging fire trail around the tree, and burning the bark and brush.

Two and three man treating crews finally merged into six

and eight-man crews with a man to act as a straw-boss. This man kept the men working to best advantage by having part of the crew on one tree and part on another and always having the next tree located ahead of time. That reduced the amount of search time and usually gave the straw-boss time to do considerable productive work with the crew.

METHOD NO. 2 (Falling and Treating Combined)

With this method two crews of two and three men each did the falling, limbing, peeling, and burning at one process. This was only done on two sections out of the nineteen, with a total of 94 trees and a scale of 146,260 bd. ft. However, it should serve as fair comparison of the cost of the two methods.

In order to be as fair to both methods as possible one section having only 32 trees was used while the other had 62 trees. One was considerably under the average per section and the other slightly over the average.

The combined results of the two methods and a comparison with each method is shown in tabulated form below.

Amount of Work Accomplished & Costs

Treating Method No. 1 (Falling & Treating Separately)

	No. of Trees Treated	Vol. B.M. Treated	Acres Treated
	Total	Total	Total
	933	1,305,020	10,860
Man Days	745	745	745
Total Cost	3009.13	3009.13	3009.13
Cost Per Unit:	3.225	2.300	.277

Treating Method No. 2 (Falling & Treating combined)

	No. of Trees Treated	Vol. B.M. Treated	Acres Treated
	Total	Total	Total
	94	146,260	1,280
Man Days	59	59	59
Total Cost	$238.70	$235.70	$238.70
Cost Per Unit:	2.486	1.598	.186

ENTIRE AREA

	No. Trees Spotted*			No. Trees Treated			Vol. B.M. Treated			Acres Treated		
	Co.	U.S.	Total	Co.	U.S.	Total	Co.	U.S.	Total	Co.	U.S.	Total
	499	528	1027	499	539	1037	731,490	722,790	1,454,280	5,440	6,700	12,140
Man Days	59	73	132	399	445	804	404	400	804	359	445	804
Total Cost	$16.11	$361.06	$707.17	$449.55	$1795.89	$3242.83	$631.14	$611.89	$3242.83	$449.55	$1795.28	$3242.83
Unit Costs			.688			3.15			2.22			.267

* Spotting figured on a per acre basis - treating figured on volume basis.
Spotting on volume basis is .496 per M.

The total project cost per M is $ .496 + $2.22 or $2.706. The spotting is not listed in treating methods No. 1 and 2, but is included separately in the entire area table. In comparing the costs of the two methods and the final total the spotting is constant for all methods. The following comparisons are readily noted:

Method No. 1 Cost per M ..... ($2.50 + .496) - $2.706
Method No. 2 " " M ..... (1.508 + .496) - 2.004
Entire Area " " M ..... (2.22 + .496) - 2.706

From these costs it appears quite certain that the cheapest method would have been by falling and treating as one process. The falling cost of $(0.446 per M) in the table for Method No. 1 is combined with the actual treating.

Perhaps the largest item in the difference in cost in the two methods was caused by the same ground being covered twice. There was in addition to the travel time being doubled the amount of search time, which in most cases was greater for the treaters than for the fallers. Another point was that the persons falling their own trees, after a few trials at treating them were soon able to place them in the most advantageous place. There was a chance that the labor in one case was better than the other, but there was probably very little difference. Of course, had these trees been close together with practically no travel or search time

involved between them the results would be much different. Method No. 2 can only be used when weather is dry. In wet winter weather the bark gets so thoroughly water soaked that it is practically impossible to burn it without too much loss of time.

Due to the fact that comparative costs of the two methods were not determined until the project had been completed it was not possible to apply the cheaper method to a greater degree.

In addition to the direct project costs the following contributed costs are here shown as a final total cost of the work done:

CONTRIBUTED COSTS

U. S. Forest Service			McCloud River Lumber Company			
Salaries (2 men)	Expenses	Total	Value of Equip.(use)	Road Opening	Trans. (Truck Hire)	Total
680.08	10.00	690.08	50.00	120.00	186.00	356.00

Cost per M - - - - - - - $ .474 Cost Per M - - - - - - - $ .245

Total contributed - - - - - - - - - - - - - - (.474 + .245 = .729

Thus, the final treating costs per M are as follows:

Direct Project Costs ($4000.00 Fund) - - - - - - - $2.706
Contributed Costs (U. S. & Company) - - - - - - - .729

Grand Total - - $3.435

COMPARATIVE RESULTS OF RECOMMENDED AND TREATED AREAS

Area Recommended			No. of Trees (Estimated)				Vol. Per Tree (Est.)		
Co.	Gov't.	Total	Co.	Gov't.	Total	Per Sec.	Co.	Gov't.	Ave. B.M.
4,080	5,180	9,260	500	500	1000	70	-	-	1,000 to 1200

Area Treated			No. Trees (Treated)				Vol. Per Tree (Treated)			Complete Vol. (Treated)		
Co.	Gov't.	Total	Co.	Gov't.	Total	Per Sec.	Co.	Gov't.	Ave. B.H.	Co.	Gov't.	Total
5,440 A or 8.5 Secs.	6,700 A or 10.5 Sec.	12,140 A or 19 Secs.	499	528	1027	54	1466	1389	1416	731,490	733,700	1,454,890

From this table it is seen that while more area of government was covered involving a few more trees than company there was a slightly greater volume of company timber treated. There were fewer trees per section on government lands and a smaller volume per tree. There was an average of 53.7 trees per section on company lands and an average of 50.3 trees per section on government lands. It was originally considered that the heaviest infestation would be found on the company lands having the deeper soils. In general it was true that more bug trees were found on the company lands, but it was also true that the density of the timber was greater on the company lands than on the government. Section 19, T. 41 N., R. 5 E., of government in the lavas had a total of 103 bug trees or 30 trees more than its nearest competitor of 73 trees in Sec. 15, also a government lava type. On the other hand there was a total of 62 trees on the north half of Sec. 31, T. 41 N., R. 5 E., which was a deep soil type on company lands, and had the entire section been spotted it might have been a record section. There appeared to be no uniformity in the bugs choice of timber types, densities, or depths of soil.

AVERAGES

On a volume basis the average tree treated contained 1,416 bd. ft. From the Site III Volume table this would be a 32 inch B.B.H. 5 log tree. The above table of "comparative results" will show all other averages or totals desired.

PROJECT COST SUMMARIZATIONS

	Total	Cost per Man Day
Salaries and Wages (All workers)	2,216.37	2.36
Board & Lodging (All workers)	1,342.52	1.37
Transportation (Gas. & oil)	193.00	.20
Equipment (Tools, etc.)	54.20	.03
Miscellaneous (Overhead, (Travel & Subsistence)	164.02	.17
Total for Project	3,930.00	4.03

LABOR AND COST DISTRIBUTION

	No. Man Days	Total Cost	Cost Per Man Day
Bookkeeping and Other overhead items	77	$183.91	2.06
Spotting (Wages, spotting Crew)	132	470.16	3.63
Felling (Wages, Fellers)	134	396.12	2.63
Treating (Wages, treating Crews)	690	1170.18	1.72
Transportation (Wages, gas. & oil)	983	181.00	.19
Equipment (Repairs & Replacement)	981	54.20	.04
Non-effective items (Fire suppression, etc.)	981	95.00	.10
Board & Lodging	981	1342.52	1.37
Miscellaneous	981	164.02	.17
Total		$3930.00	

The above distributions are from the $4000.00 project fund entirely, and do not include any contributed costs. The correct total of the amount spent is not yet available but it approximates $3930.00

A map of the area treated is attached to the report.

Form 335

T. 41N R. 4E M.D. Mer.

To Medicine Lake

Raymond

Plava RS

Sheep Camp

LEGEND

- Treating Boundary
- Brush and Timber Bound
- 16 Company Area
- Main Roads
- Passable Routes
- One Tree, four Trees per

SUMMARY OF REPORT

ORGANIZATION

Coop. 50-50 Basis F.S. & McCl. Co. Total funds for direct exp. $4000. F.S. contrib. two J.F.s for overhead Co. contrib. transp & equipment.

Spotting } 1 Compassman - 3 spotters. 4 to 6 mi. of 10 ch. strip daily.

Falling } 2½ falling Crews using plats for location.

Treating } "Protective" Strawboss System. Crews varying in size from 3 to 10 men. Plat sheet & Compass location. Maximum No. men Treating - 32

- VALUES WORKED -

	U.S.	Co.	Total
Acres	6,700	5,440	12,140
Trees	528	499	1,027
Vol. in M.B.M	722,790	731,490	1,454,280

- UNIT VALUES -

	U.S.	Co.	Average ~~Total~~
Trees per Sec.	50.3	58.7	54
Vol. per Tree	1369	1466	1416

DIRECT COSTS PER UNIT

	U.S.	Co.	Ave.
Tree			.385
Acre			.33
M.B.M			2.72

CONTRIB. COSTS PER M.B.M.

	U.S.	Co.	~~Total~~ Ave.
Transportation	.01	.24	.25
Supervision	.47	—	.47

SCALE. Two inches = 1 mile.

WHITE HORSE 9 MI.